

A Comparative Study of Laparoscopic Suture Rectopexy and Laparoscopic Trans Anal Suture Rectopexy

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ABSTRACT

BACKGROUND

The objective of this observational study is to compare outcome of LTSR and LSR in terms of symptomatic relief and its complications.

METHODS

Forty patients were subjected to LTSR and LSR between January 2015 and January 2020. The surgical technique used was fixation of posterior rectal wall and mesorectum to the sacral promontory and presacral fascia with PDS suture with infiltration of sclerosant in between the sutures in LTSR, while in LSR posterolateral wall of rectum is sutured with sacral promontory with Prolene suture.

RESULTS

Postoperative hospital stay was 2-5 days in LSR, while 1-2 days in LTSR. One patient had recurrence in LTSR at 2 years, while no recurrence in LSR on 2-5 years follow up. Symptomatic relief was 25-100% in LSR, while it was >75% in LTSR.

CONCLUSIONS

LTSR is a simple, low cost technique with less morbidity, less hospital stay, greater improvement in post-operative symptoms in the patients of rectal prolapse, thus changing the trend from laparoscopic to minimal invasive natural orifice procedure.

KEYWORDS

LTSR (Laparoscopic Trans Anal Suture Rectopexy), LSR (Laparoscopic Suture Rectopexy), NRA (No Reference Available)

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BACKGROUND

Rectal prolapse is the protrusion of full thickness rectal wall through the anal canal. Historically it affects women more often than men, at a ratio of 6:1.¹ Patients with rectal prolapse suffers from anal incontinence, constipation, mucous or blood discharge from the protruding tissue and pain. Patient with rectal prolapse frequently found to have anatomic characteristics, like diastasis of the levator ani, abnormally deep cul-de-sac, redundant sigmoid colon, patulous anal sphincter, and loss of the rectal sacral attachments are commonly described. Several treatment methods have been proposed which includes various procedures performed through perineal, abdominal or trans anal approach, all giving good results, but none without recurrence even if candidate selected properly.²

When comparing between the different treatments modalities for rectal prolapse post-operative morbidity, recurrent rectal prolapse, fecal incontinence, and worsening constipation are all important outcome variables to examine. The choice of approach is largely influenced by surgeon preference as well as patient factors, including comorbidity, age, gender and sexual activity. Most surgeons prefer perineal procedures in elderly or frail patients and abdominal approaches in fit patients.³ Although there is increasing evidence that laparoscopic procedures are safe even in the very elderly.⁴ The choice of procedure should also take into account the presence of concurrent genital prolapse, constipation, evacuatory difficulties, faecal incontinence and history of pelvic floor injury.⁵ In 2015 Cochrane review of 15 randomized control trials and over 1000 patients failed to display superiority of any approach in terms of recurrence rate and quality of life after procedure.⁶

Resection rectopexy has traditional been recommended for patients who have both constipation and rectal prolapse, although there is little evidence to support this practice. Men tend to be offered perineal procedures in view of the potential for erectile dysfunction from rectal mobilization during abdominal approaches. With the evolution of laparoscopic colorectal surgery, the benefits of laparoscopic rectopexy over open rectopexy are obvious, particularly when the results of both the procedures are comparable.⁷⁻⁹ However, a colonic resection requires a colonic anastomosis and an abdominal incision to retrieve the specimen, making it technically demanding and time consuming.¹⁰

Laparoscopic posterior mesh rectopexy without resection has the problems of increased constipation after surgery in addition to increased cost of the mesh.¹¹ On the other hand, suture rectopexy without resection may be regarded as an ideal laparoscopic procedure in that it can be performed entirely intracorporeally and by avoiding the use of a mesh improve functional results such as constipation. The objective of this study is to compare the outcome of the two commonly performed procedure (i.e. LSR and LTSR) at our center. Since principally LSR and LTSR (fixation of posterior rectal wall with pre sacral fascia) achieve same objective, outcome of both this procedure has not been compared in the past. Earlier Prolene mesh was being used for the

fixation purpose, but in the long term follow up it was encountered that the management of recurrence were very difficult. This led to more surgeon started doing LSR, which was easily manageable in the case of recurrence. But as we all know this is an era of minimal invasive surgery which led to the innovation of the procedure LTSR which gave comparable results and better symptomatic improvement, less invasive, avoiding risk of general anaesthesia, less hospital stay, less morbidity, etc.¹²

We wanted to compare laparoscopic suture rectopexy and laparoscopic trans anal suture rectopexy in terms of: intra operative complications, peri operative complications & recurrences.

METHODS

We have studied the records of patients operated for LSR and LTSR from Jan 2015 to Jan 2020 at SMIMER and documented outcomes of these procedures in terms of symptomatic relief and its complications. All patients were followed at 1 month and then yearly. In LSR group patients had been followed for 2 to 5 year and in LTSR group follow up duration is from 1 to 3 years. None of these patients had history of previous intervention for rectal prolapse.

Inclusion Criteria

- Full thickness rectal prolapse.
- Age 15-80 years.

Exclusion Criteria

- Large bowel malignancy
- Unfit for surgery
- Hip joint pathology, not able to give lithotomy position
- Previous pelvic surgery
- Inflammatory and infective pathology of rectum
- Previously operated for rectal prolapse
- Associated anterior compartment prolapses

Technique

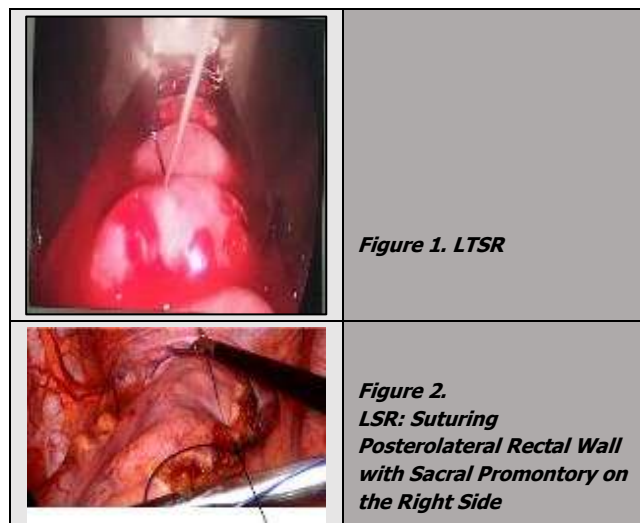
LTSR- Preoperatively day before the surgery laxatives are given and enema is given on the day of surgery. Prophylactic antibiotic (inj. ceftriaxone 1 gm and inj. Metronidazole 500 mg) are given intravenously before surgery. After giving saddle or spinal anaesthesia, high lithotomy position is given with steep head low. With the help of specially designed proctoscope (made up of stainless steel of 22 cm in length, circumference of 12 cm), prolapse is reduced and rectal wall stretched, and then four to five stitches are taken starting from the level of sacral promontory. Further three to four stitches are placed below it at the gap of 2-3 centimeters with the help of PDS no. 0 suture (40 mm needle, round body). To ensure proper placement of the stitches we gave testing traction on suture line to confirm inclusion of pre sacral fascia along with rectal wall in the stitch before tying the knot. In between two stiches 1.5 ml of 0.5% povidocanol

was injected beyond the rectal wall to increase the fibrosis between rectum and pre sacral fascia. Patient were advised not to strain for 3 months. All patients were discharged on 2 post-operative day on oral laxatives. Patient were followed up at 6,12,18,24 months (for the period of 6 months to 24 months).

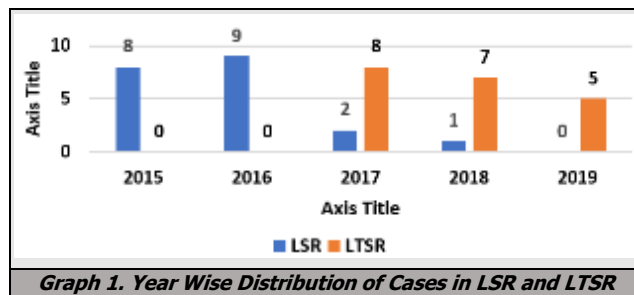
LSR- Preoperatively day before the surgery bowel preparation is done with Peglec (polyethylene glycol) and enema is given on the day of surgery. Prophylactic antibiotic (inj. ceftriaxone 1 gm and inj. Metronidazole 500 mg) are given intravenously before surgery. After giving general anaesthesia two (10 mm) ports are inserted, one supra umbilical and another at right mid clavicular line at the level of umbilicus, and two (5.5 mm) ports are inserted, one 2-3 cm medial to the right ASIS and other in the left mid clavicular line above the level of umbilicus. Head low position is given. Rectum is pulled up and peritoneum is incised at sacral promontory and dissection is continued in avascular plane between rectum and presacral fascia with successive division of peritoneum lateral to rectum up to recto vesical pouch. Precaution is exercised not to damage ureter, hypogastric nerves, and pre sacral venous plexus. We cross from right to left behind rectum at the level of sacral promontory by dividing left lateral peritoneum to match the dissection behind rectum. The division of lateral peritoneum medial to left ureter is continued downward till left lateral pedicle of the rectum. Two stitches are taken, between the postero lateral wall of the rectum and sacral promontory with Prolene No 1-0 suture one on either side keeping rectum straight out of pelvis. Peritoneum is closed with Vicryl No 2-0 suture interrupted fashion.

LTSR	LSR
Transanal route	Laparoscopic transperitoneal route
Straightening up of rectum with help of rectoscope pushed transanally	Straightening up of rectum by mobilization from sacrum
Fixation of posterior rectal wall with pre sacral fascia and sacral promontory through rectal lumen with PDS.	Fixation of postero lateral wall with sacral promontory with Prolene
Full thickness rectal wall taken in the stitch	Seromuscular wall of rectum is taken in the stitch
Fibrotic adhesion between rectal wall and pre sacral fascia with the help of sclerosant injected in between sutures.	Fibrotic adhesion between rectal wall and pre sacral fascia is natural due to extensive dissection behind rectum

Table 1. Operative Principle of LTSR and LSR



RESULTS



In our study maximum no of LSR had been performed in year 2016 (09 cases) followed by year 2015 (08 cases), while no LSR done in year 2019. Maximum no of LTSR had been performed in year 2017 (08 cases), followed by year 2018 (07 cases) and in the year 2019 (05 cases).

	Male	Female	Total
LSR	16	4	20
LTSR	14	6	20
Total	30	10	40

Table 2. Sex Distribution

In our study, LSR arm there 80% male and 20% female, while in LTSR there were 70% male and 30% female.

	LSR	LTSR
Average Time	120 min.	50 min.
Minimum Time	125 min.	35 min.
Maximum Time	180 min.	75 min.
Hospital Stay	4-5 days	38 hours

Table 3. Operative Time & Hospital Stay

In our study average time for LSR is 120 mins, while for LTSR it is 50 mins. Minimum time for LSR is 125 mins, while for LTSR it is 35 mins. Maximum time for LSR is 180 mins, while for LTSR it is 75 mins. In our study patients of LSR had hospital stay of 4-5 days, while those of LTSR had hospital stay of 38 hours.

In our study maximum number of patients had prolapse of 6-8 cm in both arms.

	LSR	LTSR
Bleeding (>10 ml)	12	1
Bowel Injury	0	0
Bladder Injury	0	0
Ureter Injury	0	0
Vascular Injury	0	0
Nerve Injury	0	0
Conversion to Open	2	N/A

Table 4. Complication (Intraoperative)

In our study, 60% cases had bleeding more than 10 ml in LSR, while 5% has bleeding more than 10 ml in LTSR. Two cases in LSR were converted to open surgery.

Sl. No.	Symptoms	Pre-Operative		Post-Operative		Improvement in		Deterioration in	
		No. of PT LTSR	LSR	No. of PT LTSR	LSR	No. of PT LTSR	LSR	No. of PT LTSR	LSR
1	Bleeding p/r	12	14	2	3	10	11	0	0
2	Something Coming Out per Anus	20	20	1	0	19	20	0	0
3	Constipation	18	16	4	8	14	8	0	0
4	Diarrhoea	0	0	0	0	0	0	0	0
5	Difficulty in Micturition	8	6	2	4	6	2	0	0
6	Pelvic Pain	8	6	0	6	0	0	0	0
7	Incomplete Evacuation	16	18	2	4	14	14	0	0
8	Anal Incontinence	0	0	0	0	0	0	0	0
9	Recurrence	N/A	N/A	0	1	N/A	N/A	N/A	N/A

Table 5. Symptomatic Improvement/ Deterioration on Long Term Follow Up (2-5 Years Follow Up Period)

The above result is based on the follow up last follow up. In my study eight symptoms were studied preoperatively in each patient and most of the symptoms had shown improvement clinically post procedure ranging from 75%-100% in LTSR, while LSR showed symptomatic improvement in all except for pelvic pain. In our study, we have recorded single recurrence in LTSR group at 02 years follow up, while no recurrence in LSR even on 5 year of follow up (up to Jan 2020).

In our study, we have recorded single recurrence in LTSR group at 02 years follow up, while no recurrence in LSR even on 5 year of follow up (up to Jan 2020).

DISCUSSION

In our study we initially started with laparoscopic suture rectopexy as the choice of treatment in the patients of rectal prolapse from year 2015 (8 cases in 2015, 9 cases in 2016, 2 in 2017, and 1 case in 2018). There was decreasing trend the following years and LTSR was started to be practiced from the year 2017. In 2018 LSR was performed in just a single patient and none in the year 2019 and all other cases was effectively managed with LTSR (8 cases in 2017, 8 cases in 2018 and 5 cases in 2019).

Before 2015 open wells rectopexy and laparoscopic mesh rectopexy was practiced in our institute. The shifting trend from mesh rectopexy to LSR was due to difficulty in managing the cases of recurrence, while the LTSR becoming popular over LSR in recent years is because of its minimal invasive, less operative time, less morbidity and most important, case of recurrence can be easily managed with other procedures.

In our study the male/ female ratio is 3:1 (in LSR) and 2.33:1 (in LTSR), which is contrary to published other studies showing male/ female ratio of 1:6.^{1,2}

The average operating time for LSR was about 120 mins while that of LTSR was about 50 mins, while other studies on LSR had average operating time about 60-100 mins.¹³ In our study, most of the cases had a prolapse size of about 6-8 cm, only one case with prolapse greater than 10 cm was

present which was treated with LTSR. We have also observed that more the prolapse size greater are the chances of post-operative complications or getting less relief of symptoms.

References	LSR	LTSR
Ismail et al	60 (range: 50-70)a	NRA
Potter et al	72 (range: 28-117)	NRA
Awad et al	77.5 (range: 30-150)	NRA
Mokhtar et al	58.42±22.75a	NRA
Koivusalo et al	80 (range: 62-90)	NRA
Our study	120 min	50 min

Table 6

The average hospital stay was about 1-2 days in LTSR, while the patient undergoing LSR had a stay of 4-5 days, thus making LTSR a very attractive, simple, easy, with less operative time, less morbid, and less hospital stay.

References	LST	LTSR
Ismail et al	3 days	NRA
Awad et al	1 day	NRA
Mokhtar et al	2.50 days	NRA
Koivusalo et al	6 days	NRA
Our study	4-5 days	38 hrs

Table 7. Mean Hospital Stay for Different Studies of LSR and LTSR^{12,13}

In our study there is significant reduction in the symptoms post operatively, in both the procedure for rectal prolapse, but LTSR appears to be very attractive, simple, easy with less operative time, less morbidity and post-operative complications. For LTSR other studies had shown reduction in symptoms post operatively ranging from 20-90% while in our study relief was present in about 20-100% (in both arms), making this procedure more effective as compared to other procedures.¹⁴⁻¹⁹ In our study there is no deterioration of the symptoms post operatively, except for pelvic pain which had not shown any improvement in LSR.¹²

Single case of recurrence (5%) was there with LTSR, while none were there with LSR. Patient factor have to be considered with the procedure failure as the patient which had recurrence was having a prolapse of greater than 10 cm, reduced anal tone and was managed with added Thiersch wiring.²⁰⁻²¹

Abdominal Procedure ²²⁻²⁷	RR (%)	Perineal Procedure ^{12,28-34}	RR (%)
Mesh Rectopexy	2-5%	Altemeier Procedure	12-24%
Suture Rectopexy	3-9%	Delorme Procedure	12-31%
Resection Rectopexy	2-5%	Thiersch Procedure	Up to 75%
Ventral Rectopexy	2-9%		
LSR (our study)	0%	LTSR(our study)	5%

Table 8. Recurrence of Various Procedures for Rectal Prolapse

CONCLUSIONS

On comparing our results of both the procedures, there is a significant improvement in the symptoms post operatively, with both the procedures maintaining the ideal principle of rectal prolapse surgery. The difference between the two is that of less operative time, less hospital stay, less morbidity, less dissection thus making the LTSR very attractive, simple, easy procedure in comparison to LSR. LSR requires a

complete laparoscopic unit with more number of instruments in comparison to LTSR. LSR requires a greater learning curve in comparison to LTSR. LTSR being a natural orifice surgery is cosmetically superior to LSR.

REFERENCES

- [1] Henry MM, Swash M. *Coloproctology and the pelvic floor*. 2nd edn. Oxford: Butterworth-Heinemann Ltd 1996.
- [2] Nicholls RJ, Banerjee A. Rectal prolapse and solitary rectal ulcer syndrome. In: Nicholls RJ, Dozois RR, eds. *Surgery of the colon & rectum*. New York: Churchill Livingstone 1997:709-737.
- [3] Cirocco WC, Brown AC. Anterior resection for the treatment of rectal prolapse: a 20-year experience. *Am Surg* 1993;59(4):265-269.
- [4] Keighley MR, Shouler PJ. Abnormalities of colonic function in patients with rectal prolapse and faecal incontinence. *Br J Surg* 1984;71(11):892-895.
- [5] Mann CV, Hoffman C. Complete rectal prolapse: the anatomical and functional results of treatment by an extended abdominal rectopexy. *Br J Surg* 1988;75(1):34-37.
- [6] Maggiori L, Bretagnol F, Ferron M, et al. Laparoscopic ventral rectopexy: a prospective long-term evaluation of functional results and quality of life. *Tech Coloproctol* 2013;17(4):431-436.
- [7] Kessler H, Jerby BL, Milsom JW. Successful treatment of rectal prolapse by laparoscopic suture rectopexy. *Surg Endosc* 1999;13(9):858-861.
- [8] Kellokumpu IH, Vironen J, Scheinin T. Laparoscopic repair of rectal prolapse: a prospective study evaluating surgical outcomes and changes in symptoms and bowel function. *Surg Endosc* 2000;14(7):634-640.
- [9] Baker R, Senagore AJ, Luchtefeld MA. Laparoscopic assisted versus open resection. Rectopexy offers excellent results. *Dis Colon Rectum* 1995;38(2):199-201.
- [10] Solomon MJ, Young CJ, Evers EJ, et al. Randomised clinical trial of laparoscopic versus open abdominal rectopexy for rectal prolapse. *Br J Surg* 2002;89(1):35-39.
- [11] Hartley JE, Farouk R, Monson JR. Laparoscopic suture rectopexy for full thickness rectal prolapse. *Minim Invasive Ther Allied Technol* 1996;5:540-542.
- [12] Morsi AH, Eishahat W, Kassem H, et al. Short-term outcome of suture rectopexy in children with rectal prolapse: laparoscopic versus posterior sagittal approach. *Egypt J Surg* 2019;38(1):106-112.
- [13] Sayfan J, Pinho M, Alexanders-Williams J, et al. Sutured posterior abdominal rectopexy with sigmoidectomy compared with Marlex mesh rectopexy. *Br J Surg* 1990;77(2):143-145.
- [14] Carter AE. Rectosacral suture fixation for complete rectal prolapse in the elderly, the frail and the demented. *Br J Surg* 1983;70(9):522-523.
- [15] Novell JR, Osborne MJ, Winslet MC, et al. Prospective randomized trial of Ivalon sponge versus sutured rectopexy for full-thickness rectal prolapse. *Br J Surg* 1994;81(6):904-906.
- [16] Graf W, Karlbom U, Pählman L, et al. Functional results after abdominal suture rectopexy for rectal prolapse or intussusception. *Eur J Surg* 1996;162(11):905-911.
- [17] Khanna AK, Misra MK, Kumar K. Simplified sutured sacral rectopexy for complete rectal prolapse in adults. *Eur J Surg* 1996;162(2):143-146.
- [18] Kellokumpu IH, Virozen J, Scheinin T. Laparoscopic repair of rectal prolapse: a prospective study evaluating surgical outcome and changes in symptoms and bowel function. *Surg Endosc* 2000;14(7):634-640.
- [19] Heah SM, Hartely JE, Hurley J, et al. Laparoscopic suture rectopexy without resection is effective treatment for full-thickness rectal prolapse. *Dis Colon Rectum* 2000;43(5):638-643.
- [20] Hoel AT, Skarstein A, Ovrebø KK. Prolapse of the rectum, long-term results of surgical treatment. *Int J Colorectal Dis* 2009;24(2):201-207.
- [21] Carter AE. Rectosacral suture fixation for complete prolapse in the elderly, the frail and the demented. *Br J Surg*. 1983; 70: 522-523.
- [22] Portier G, Iovino F, Lazorthes F. Surgery for rectal prolapse: Orr-Loygue ventral rectopexy with limited dissection prevents postoperative-induced constipation without increasing recurrence. *Dis Colon Rectum* 2006;49(8):1136-1140.
- [23] Luukkonen P, Mikkonen U, Järvinen H. Abdominal rectopexy with sigmoidectomy vs. rectopexy alone for rectal prolapse: a prospective, randomized study. *Int J Colorectal Dis* 1992;7(4):219-222.
- [24] Mckee RF, Lauder JC, Poon FW, et al. A prospective randomized study of abdominal rectopexy with and without sigmoidectomy in rectal prolapse. *Surg Gynecol Obstet* 1992;174(2):145-148.
- [25] D'Hoore A, Penninckx F. Laparoscopic ventral recto (colpo) pexy for rectal prolapse: surgical technique and outcome for 109 patients. *Surg Endosc* 2006;20(12):1919-1923.
- [26] Samaranyake CB, Luo C, Plank AW, et al. Systematic review on ventral rectopexy for rectal prolapse and intussusception. *Colorectal Dis* 2010;12(6):504-512.
- [27] Boons P, Collinson R, Cunningham C, et al. Laparoscopic ventral rectopexy for external rectal prolapse improves constipation and avoids de novo constipation. *Colorectal Dis* 2010;12(6):526-532.
- [28] Tou S, Brown SR, Nelson RL. Surgery for complete (full-thickness) rectal prolapse in adults. *Cochrane Database Syst Rev* 2015;(11):CD001758.
- [29] Kim M, Reibetanz J, Schlegel N, et al. Recurrence after perineal rectosigmoidectomy: when and why? *Colorectal Dis* 2014;16(11):920-924.
- [30] Kim M, Reibetanz J, Schlegel N, et al. Perineal rectosigmoidectomy: quality of life. *Colorectal Dis* 2013;15(8):1000-1006.

- [31] Senapati A, Gray RG, Middleton LJ, et al. PROSPER: a randomised comparison of surgical treatments for rectal prolapse. *Colorectal Dis* 2013;15(7):858-868.
- [32] Placer C, Enriquez-Navascués JM, Timoteo A, et al. Delorme's procedure for complete rectal prolapse: a study of recurrence patterns in the long term. *Surg Res Pract* 2015;2015:920154.
- [33] Berkowitz J. Correction of rectal procidentia; the Thiersch operation as a simple palliative procedure. *N Engl J Med* 1953;248(17):720-722.
- [34] Gabriel WB. Thiersch's operation for anal incontinence and minor degrees of rectal prolapse. *Am J Surg* 1953;86(5):583-590.